

REMARKS

Claims 1-11 are all the claims pending in the application.

Claim 1 has been amended to more clearly point out the currently claimed subject matter. Support of the amendment can be found in the specification, for example at page 10, lines 6-15, and at page 13, line 15-20.

Claim 9 has been amended to more clearly point out the currently claimed subject matter. Support of the amendment can be found in the specification, for example at page 10, lines 13-15.

Claims 1-10 have been amended to remove the reference characters.

No new matter has been added. Entry of the Amendment is respectfully requested.

I. Drawings

Applicants respectfully request the Examiner to acknowledge and to accept the drawings (sheets 1/4 to 4/4) filed on September 24, 2004.

II. Information Disclosure Statement

Applicants thank the Examiner for acknowledgement and acceptance of the Information Disclosure Statements filed September 24, 2004 and February 11, 2005, by including an initialed copy of the Forms PTO-1449 submitted therein.

III. Claim of Foreign Priority

Applicants thank the Examiner for acknowledgement of the claim of priority to Japanese Application No. 2002-085149 filed March 26, 2002, as well as receipt of the certified copy of the priority document in this application.

IV. Claim Objections

Claims 1-11 are objected to by the Examiner because they include reference characters which are not enclosed within parentheses.

Claims have been amended to remove the reference characters.

V. Claim Rejections under 35 U.S.C. § 112

Claims 1-11 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The Examiner points out that claim 1 recites the limitations "the other end part" in line 4, "the process" in line 10, "the inner tube" in line 11 and "the outer tube" in line 11. The examiner states there is insufficient antecedent basis for these limitations in the claim.

Claim 1 has been amended to provide proper antecedent basis for "the other end part", "the process", "the inner tube" and "the outer tube".

In addition, the Examiner points out that Claim 3 recites the limitation "the ceiling part" in line 3; Claim 5 recites the limitation "the fins" in line 2; and Claim 9 recites the limitations "the inner tube" in line 2, "the outer tube" in line 3, "the gas" in line 5, "the temperature difference" in line 8, and "the gas flow direction" in line 8. There are insufficient antecedent basis for these limitations in the claims. Claims 3, 5 and 9 have been amended to provide proper antecedent basis for those terms.

In view of the above, withdrawal of the rejections is respectfully requested.

VI. Claim Rejections under 35 U.S.C. § 102

Claims 1, 2, 6, 9 and 10 are rejected under 35 U.S.C. § 102(b) as being anticipated by Christensen (US 3,041,151; “Christensen”). Applicants respectfully traverse this rejection.

The Examiner asserts that Christensen discloses a reaction apparatus comprising a heat exchanger (shell (6), tubes (21)) and a reactor (catalyst bed, (11)) with a heater (electric heater, (7), col. 4 lines 24-26)), which are enclosed in an outer casing (shell (1)), the top of the heat exchanger (6, 21) being connected to the reactor (11), the other end part of the heat exchanger (6, 21) and the bottom of the outer casing 6 being fixed to each other by a flange (cap, (45) see Fig. 2), and a double piping (see Fig. 2) for introducing a gas to be treated through the inner pipe (49) and discharging the treated gas through the annular space, or outer pipe (see Fig. 2), such that the gas passes through the heat exchanger (6,21), the reactor (11) and the heat exchanger (6,21) in this order during the process (see gas flow directions in Fig. 2).

The Examiner further asserts that Christensen discloses a method comprising passing a gas to be treated sequentially into an inner tube (49) in a double piping (see Fig. 2), a heat exchanger (shell (6), tubes (21)), a reactor (11) with a heater (7), the heat exchanger and the outer tube (51) in the double piping in this order and heating the gas to be treated by the heater before the gas to be treated is introduced into the reactor (col. 4 lines 19-29), thereby adjusting the temperature difference in the gas flow direction inside the reactor.

However, Christensen does not disclose each and every feature of the claimed subject matter as presented in Claim 1 of the present application.

In more detail, Christensen does not disclose or teach a double piping for introducing a gas to be treated and for discharging the treated gas, wherein the double piping has an inner tube

and an outer tube, wherein the double piping is being connected to the second end of a heat exchanger, such that gas passes through the heat exchanger, the reactor and the heat exchanger in this order during a process from introducing gas through one of the inner tube and the outer tube in the double piping to discharging the gas through the other tube of the inner tube and the outer tube.

Christensen discloses an unconverted feed gas enters via 4 and passes down through the annular space between shell 1 and circulating plate 5. The gas stream leaves the annular space toward the bottom of the converter chamber, and passes upward on the shell side of the heat exchanger defined by plate 6, tubes 21 and baffles 22. Col. 3, lines 53 - 60. Eventually, as stated in Christensen, the gas stream leaves the bottom of passages 17 and becomes a single combined flow, leaving the converter via central passage 23 and exit conduit 38. Col. 4, lines 43-45. The Examiner appears to consider reference 49 as corresponding to the double piping. However, reference 49 is a conduit for supplying a cold gas to control the temperature, which is not a gas to be treated and is a single pipe. Col. 5, lines 5-9. Thus, it does not correspond to the double piping of claim 1 as claimed by the instant invention.

Furthermore, with respect to Claim 9, Christensen does not disclose or teach a reaction method comprising the steps of introducing a gas into a double piping, wherein the double piping has an inner tube and an outer tube. Moreover, the step of passing gas in the particular sequential arrangement as claimed in the present application is not disclosed or taught by Christensen.

Therefore, it is respectfully submitted that the rejection of Claims 1, 9 and the claims which directly or indirectly depend from Claims 1 and 9 are not anticipated under 35 U.S.C. § 102(b), is not sustainable and Applicants respectfully request that the rejection be withdrawn.

VII. Claim Rejections under 35 U.S.C. § 103

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Christensen as applied to claim 1 as discussed above, and further in view of Keto et al. (US 3,732,517; “Keto”).

Claims 4 and 5 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Christensen as applied to claim 1 as discussed above, and further in view of Serratore et al. (US 3,278,633; “Serratore”).

Claim 7 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Christensen as applied to claim 6 above, and further in view of Nakamura et al. (US 3,814,171; “Nakamura”).

Claim 8 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Christensen.

Claim 11 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Christensen.

Applicants respectfully traverse the rejections for the following reasons.

Christensen does not disclose or teach a double piping for introducing a gas to be treated and for discharging the treated gas, wherein the double piping has an inner tube and an outer tube.

None of the cited references, Keto and Serratore and Nakamura, either alone or in combination, discloses or teaches a double piping configuration; much less a double piping having an inner tube and an outer tube, wherein the double piping is being connected to the second end of a heat exchanger, such that gas passes through the heat exchanger, the reactor and the heat exchanger in this order during a process from introducing gas through one of the inner tube and the outer tube in the double piping to discharging the gas through the other tube of the

AMENDMENT UNDER 37 C.F.R. § 1.111

Application No.: 10/508,858

Attorney Docket No.: Q69368

inner tube and the outer tube. Thus, Keto and Serratore and Nakamura, either alone or in combination, does not make up the deficiency of Christensen.

Accordingly, in view of the above, Applicants believes that Claims 3-8 and 11 all patentable and it is respectfully requested that the rejection be withdrawn.

VIII. Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

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